



ANALYSIS OF BENEFITS AND DRAWBACKS OF TRADITIONAL ERP VERSUS CLOUD BASED ERP SYSTEMS

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Abstract: Traditional ERP systems provide various kinds of benefits such as mature system functionality and abilities of greater customization and integration. But purchasing and implementing traditional ERP system (on-premise) is always costly and difficult job for any organization and involves a great risk and consume more time. Implementing traditional ERP means deploying new infrastructure, purchasing servers, hardware and software thus it is always a costly affair for any organization. Cloud based ERP system architecture provides solutions to all the difficulties encountered by conventional ERP systems. It provides flexibility and improves overall efficiency. ERP software brings users economic benefits during a company's operational management. The economic benefits of ERP users are better than the non-users. All the data and information resources are managed by ERP systems in the business organizations. This information is stored in centralized and shared data stores. These days information is priceless tool for organizations and through this perspective it is important to reach all the data of a company IT system in real time. We can use cloud computing infrastructure & SaaS for low cost working. In this paper, we identify and classify the benefits and drawbacks of traditional ERP versus cloud-based ERP systems.

Keywords: Enterprise Resource Planning (ERP), Software as a Service (SaaS), ERP as a Service (EaaS), Cloud ERP, SaaS ERP, Cloud computing

1. INTRODUCTION

1.1 Traditional ERP System:

The term Enterprise Resource Planning (ERP) system dates from 1990 when Gartner used it for the first time. ERP is a kind of information system which is considered as a cross-functional process oriented and legacy system because it integrates management information across the entire enterprise and also serves the information needs of the entire enterprise.

Nowadays the ERP system is the “paradigm of organizational computing” and is referred to as the set of activities that managers used to run the important parts of an organization such as purchasing, human resources, accounting, productions and sales”

The ERP system is the most risky, time consuming and expensive IT investment in the enterprise. It is sold in modules or functional components and is employed by many users involved in business processes.

1.2 ERP System Deployment Scenarios

A traditional client-server ERP system is usually customized software, while ERP as a Service (EaaS) model is package software. In the case of client-server software, the applications and storage are centralized and have to be upgraded on the client's desktop. EaaS eliminates many barriers to implementing an ERP system.

These days organizations have three ERP system deployment scenarios. An organization has the option of purchasing a license or an SaaS ERP solution. When a license is purchased, it can deploy the legacy ERP system in its own data Centre (on-premise) or can outsource operations to an external provider (hosting off-site). An on-premise ERP system solution is known to be safer and more reliable. In the case of an SaaS ERP solution, the organization rents “a complete turnkey package that includes software and the entire delivery mechanism”. The more important thing in the SaaS ERP model is reliance on an external provider.

2. CLOUD COMPUTING

Cloud computing provides the delivery of on-demand computing resources everything from applications to data centers over the Internet on a pay-for-use basis. In cloud computing the resources are offered ‘as services’. The computing surroundings is a collection of IT components (hardware, software, networking, and services) as well as the processes around the deployment of these elements that jointly allow us to develop and deliver cloud services via the Internet or through a private network.

Cloud computing has a deep impact on the complete IT industry as a fresh business model. Included into all sectors of business applications, cloud computing will mirror the value in a deeper level. And with the quick development of cloud computing, it can assist enterprises to access high-performance IT services with much low cost, and also very helpful to small

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and medium-sized enterprises to access high-performance IT services like large enterprises. With the decrease of the IT burden, it can help enterprises to focus more on its core business. The process optimization which based on cloud computing can achieve throughout a large-scale rebuilding of the industry, and improve the overall IT values and competitiveness. A study by Gartner measured Cloud Computing as the initial between the top 10 most vital technologies and with a better vision in successive years by groups and organizations.

2.1 Cloud service delivery models:

The cloud model provides three types of services:

2.2 Software as a Service (SaaS):

In SaaS the facility provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a web browser (e.g., web-based email). Software as service features of complete application is offered as a service on demand. The services of multiple terminals or client organizations are used a single version of the software that runs on the cloud.

2.3 Platform as a Service (PaaS):

In PaaS the facility provided to the consumer is to deploy onto the cloud infrastructure his own applications without installing any platform or tools on their local machines. PaaS refers to providing platform layer resources, including operating system support and software development frameworks that can be used to build higher-level services. There are at least two viewpoints on the PaaS relying on the perspective of the creator or client of the services:

- a. The originator of PaaS can construct a platform depend on the integration of operating systems, middleware, application software, and many including the development environment that is then presented to a customer as a service.
- b. The PaaS is presented as encapsulated service through an API fashion. The client cooperates with the platform through the API. Therefore platform utilizes required steps to handle and scale itself to provide a given level of service.

2.4 Infrastructure as a Service (IaaS):

In IaaS the facility provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. Infrastructure as a service utilizes the main services such the storage and determine capabilities as modulated services over the network. Servers, storage systems, switches, routers are collective and situate available to utilize and manage a high-performance computing applications.

2.5 Cloud deployment models:

These are commonly known as Public, Private, and Hybrid models. The following sections use the National Institute of Standards and Technology definition of cloud to introduce these different types of cloud:

2.6 Public cloud:

According to NIST, a public cloud is one in which the infrastructure is open to the general public for consumption. Due to the nature of public clouds, they are exposed to a higher degree of risk.

2.7 Private cloud:

According to NIST, a private cloud is provisioned for exclusive use by a single organization comprising multiple consumers, such as business units. It may be owned, managed, and operated by the organization, a third-party, or some combination of them.

2.8 Community cloud:

NIST defines a community cloud as one whose infrastructure is provisioned for the exclusive use by a specific community of consumers from organizations that have shared concerns. For example, mission, security requirements, policy, and compliance considerations. It may be owned, managed, and operated by one or more of the organizations in the community, a third-party, or some combination of them.

2.9 Hybrid cloud:

The cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds).

2.10 Cloud ERP System:

Cloud ERP is Enterprise Resource Planning software that is hosted in a platform over the Internet. The use of the term "Cloud" includes a broad set of applications and software deployment models, namely Software-as-a-Service or SaaS.

2.11 Types of Cloud ERP:

There are mainly two types of cloud ERP, one is cloud ERP and other is SaaS ERP or EaaS.

“Cloud ERP is hoisted service delivered over the internet”. On the other hand in SaaS ERP (EaaS) the ERP system resides in the cloud, which gives the computing power to run the ERP system, here the user has to pay the subscription fee for its usage and the ERP system is available via internet connection. It is not necessary that for ERP system SaaS is a required component but the flexibility of the cloud ERP increases when it is available in SaaS model. An organization have cloud ERP without SaaS (cloud infrastructure or cloud platform), SaaS ERP without cloud (web based ERP) or SaaS ERP enabled by cloud (Cloud Application).

Vendors can offer SaaS utilizing all three cloud infrastructures above. Some vendors such as Acumatica offer all three types of services.

- Offering **SaaS using a cloud application** is straightforward. In this case the vendor builds an application which is tightly integrated with infrastructure and hardware so that the three components cannot be separated.
- Offering **SaaS using a cloud platform** means that the vendor must manage the application layer separately from the platform layer. This architecture gives the vendor the flexibility to move the application to a separate cloud platform provider.
- Offering **SaaS using a cloud infrastructure** is similar to a managed hosting scenario. In this case the vendor installs and manages both an operating system and their application on top of a multi-tenant hardware infrastructure. This technique provides maximum flexibility, but may increase overhead slightly.

2.12 Traditional ERP V/S Cloud ERP

In the case of traditional ERP, a customer purchases a software license for its selected system and deploys the product to its data center. A traditional ERP is also known as on-premises ERP. On-premise ERP solutions are installed on local company's hardware and servers and then managed by the IT staff. In Traditional ERP organization bears the cost of servicing and maintaining the internal infrastructure and acquiring any additional equipment.

A cloud-based ERP system is a hosted service that allows an organization to outsource operations, Cloud ERP—also called SaaS, or Software-as-a-Service is provided as a service. In which the provider delivers the application to customers via the Web. With this type of deployment, a company's ERP software and its associated data are managed centrally (in the Internet "cloud") by the ERP vendor and are accessed by customers using a web browser. With a cloud based ERP, the customer does not require to deploy any software, and client configuration has minimal bearing on system accessibility.

Following are some key factors that we need to discuss whether to use on-premise or cloud-based ERP software:

2.12.1. Upfront Costs

The most obvious benefit of a cloud-based solution compared with a traditional ERP system is the lower Upfront costs. On-premise ERP systems usually require large upfront investments to purchase and manage the software and the related hardware, servers, and facilities necessary to run it.

Cloud based systems provide a higher level of flexibility. They provide the firms all the services of computing, networking and storing from distinct location. Customers can reduce the infrastructure cost using Cloud ERP.

Initial costs for cloud-based ERP, are typically much lower because you simply implement the software to your requirements and then access it through your computer's internet connection. The cloud ERP provider hosts and maintains all of the IT infrastructure required, ensures the system is always running, that the data is secure, and that product enhancements are rolled out painlessly to your solution without breaking your previously implemented customizations.

2.12.2. Operating Costs

The Cloud-based ERP lowers operating costs for energy, maintenance, configuring, upgrades, and other IT staff costs and efforts. This benefit is generally considered as having increased relevance for SMEs. In case of on-premises ERP, an organization is required to retain IT staff capable of maintaining the internal infrastructure. Cloud ERP also offers a predictable, pay-as-you-go subscription model that can make cash flow management and planning much easier. The companies need not required technical abilities to maintain the systems and software packages. The capacity of the cloud based systems can be easily increased without disturbing the existing services. All the software run on top of the cloud. These abilities of cloud technology offer lot of advantages. The cost of ERP implementation is significantly reduced by introducing the cloud based approach. In case of On-premises ERP, Training is required to maintain the ERP but, In case of Cloud ERP, no training is required.

2.12.3 Deployment Cost/Speed

As we know, every ERP deployment takes time and requires a lot of planning, but cloud ERP offers greater advantages when you consider deployment cost/speed. Since cloud ERP requires no additional hardware, Customer is not required to waste time procuring and installing IT infrastructure. With cloud ERP, you can easily roll it out across multiple regions, subsidiaries, and divisions, avoiding the cost associated with those rollouts. These differences can add up to a significant time savings: Cloud ERP deployments usually take 3-6 months compared to the 12 months that it typically takes to implement an

on-premise solution.

Cloud-based ERP give you the flexibility to add more users as your business grows. It provides scalability. But on-site ERP solutions don't offer this freedom. Therefore, A customer is required to invest on additional hardware to give more employees access to an on-site system.

2.12.4 Upgrades and Updates

In case of on-premises ERP, when you upgrade with new product update, you have to start customizing from scratch because previously implemented customizations will be wiped. That's why mostly companies avoid upgrading their on-premises ERP software and just settle for running on out-of-date technology.

In case of cloud ERP, it is upgraded by the provider implicitly, you are not required on your own & you can be sure that you are always using the latest, most advanced version of your ERP software.

2.12.5 Improved accessibility, mobility, and usability

Applications over the cloud work in an open environment, which increase the accessibility options. The increase accessibility, in turn, increase the usability of the cloud ERP inside and outside the enterprise.

3. CHALLENGES OF CLOUD ERP

3.1. Subscription expenses:

To use cloud ERP the enterprises should subscribe for the used services, the subscription fees are paid periodically as long as the enterprise uses the services.

3.2. Performance risks:

Over the cloud, the clients cloud service providers are separated geographically from each other and connected to each other via the internet connection. Network failures and many other connection problems could happen over the cloud. That will be reflected directly in the cloud ERP performance.

3.3. Sensitivity of the information:

Many enterprises consider its data and information as a private property and cannot be stored outside the enterprise.

3.4. Control over cloud ERP:

Cloud ERP systems are located geographically outside the enterprise and the control process is tougher than traditional ERP systems.

3.5. Need for ERP as service standards:

Cloud ERP market is still new. There are no clear standards and regulations for managing it between cloud ERP providers and clients.

4. FUTURE SCOPE

Cloud computing has a profound impact on the entire IT industry as a new business model. Integrated into all sectors of business applications, cloud computing will reflect the value in a deeper level. With the rapid development of cloud computing, it can help enterprises to access high performance IT services with lower cost, and also conducive to small and medium-sized enterprises to access high performance IT services like large enterprises. At the same time, the reduction of IT burden can help enterprises to concentrate on its core business. The process optimization which based on cloud computing can achieve throughout a large-scale reconstruction of the industry, and enhance the overall IT standards and competitiveness.

Here are some other reasons why every enterprise might need cloud computing for their business:

Cost savings - Cloud computing removes the requirement of a company to invest in storage hardware and servers.

Focusing on the business - Since all the services will execute over the internet, a company does not have to bother about technical issues and other problems associated with physical storage and backup. A company can thus focus more on their core business.

Performance - It delivers reliable performance irrespective to the geographical location of the user. Another key feature could be the automatic updating of services and applications. Security - Cloud Computing offers optimum security which protects you against any unauthorized access, modification and loss of data.

Flexibility - Even if part of the cloud environment fails or stops working, the other resources continue to work until the problem is fixed.

5. CONCLUSION

In this paper we have tried to compare the performance of Cloud Based ERP with Traditional ERP system. The main identified benefits of cloud-based ERP in comparison with traditional ERP are lower upfront costs, lower operating costs,

rapid implementation, and scalability, focus on core competencies, rapid updates & upgrades, improved accessibility, mobility, and usability, easier integration with cloud services, and improved disaster recovery. Here we have explained the flexibility offered by cloud ERP systems. All the data stored at different locations can be easily grouped together. Reports can be generated and analyzed efficiently. All the applications can be integrated and maintenance becomes simple. Before moving to the cloud ERP system, the cloud ERP clients should balance between benefits and challenges. One benefit could lead to many challenges and on another side, some challenges could be solved by some benefits. The high rated challenges represent research points, which should be considered to improve the implementation and operation of cloud ERP systems.

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